

SEQUENCE LISTING

<110> Birkett, Ashley J.

<120> MALARIA IMMUNOGEN AND VACCINE

<130> 4564/83503 ICC-103.1

<140> 09/931,325

<141> 2001-08-16

<150> 60/225,843

<151> 2000-08-16

<150> USSN NOT YET ASSIGND

<151> 2001-08-15

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Pro Gly

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<210> 30
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<210> 31
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<210> 32
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 tccgaacggt gacccgaacg ctaatccgga gct 93

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<400> 42
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<211> 69

<212> DNA

<213> Plasmodium falciparum

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cccagagct 69

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<211> 61

<212> DNA

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<211> 69

<212> DNA

<213> Plasmodium falciparum

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 ttggatccac gttcggattc gcgtt 85

<210> 52
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<210> 55
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 Ala Asn Pro Asn Val Asp Pro Glu Leu
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<210> 58
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<213> Plasmodium falciparum

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Pro Asn Val Glu Leu
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<211> 63

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<213> Plasmodium falciparum

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<210> 63

<211> 55

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Pro Asn Val Asp Pro Glu Leu
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ccctgagct 69

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<211> 61
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<210> 69
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<212> DNA
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Val Glu Leu

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Val Asp Pro Glu Leu
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<211> 63
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gct 63

<210> 75
<211> 55
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Val Asp Pro Asn Ala Glu Leu
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Pro Cys Ser Val Thr
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Ala Gly Gln Pro Ala Gly Glu Leu
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<210> 85
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Pro Ala Gly Glu Leu
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<210> 87
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gct 63

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Gln Pro Gly Glu Leu
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<210> 93
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<210> 94
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1 5 10 15

Gln Pro Gly Ala Asn Gly Ala Asp Asn Gln Pro Gly Ala Asn Gly Ala
20 25 30

Asp Asp Gln Pro Gly Glu Leu

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<210> 96
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 <212> DNA
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 gttgatcccc cgcgcggttt gctcccggt gattaccggc gccgttcgc 109

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Asn Gln Glu Gly Gly Ala Ala Glu Leu
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<210> 98
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<210> 99
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 ccggcgc 67

<210> 100

<211> 21
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1 5 10 15

Pro Cys Ser Val Thr
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gacctaata 69

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<210> 108
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Pro Leu Thr Ser Leu Ile Pro
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<213> Hepatitis B virus

<400> 109
cgcaagctta cggaagtgtt gataggatag gg 32

<210> 110
<211> 8
<212> PRT
<213> Hepatitis B virus

<400> 110
Thr Ser Leu Ile Pro Ala Asn Pro
1 5

<210> 111
<211> 34
<212> DNA
<213> Hepatitis B virus

<400> 111
cgcaagctta tgttgatagg ataggggcat ttgg

34

<210> 112
<211> 7
<212> PRT
<213> Hepatica americana

<400> 112
Leu Ile Pro Ala Asn Pro Pro
1 5

<210> 113
<211> 31
<212> DNA
<213> Hepatitis B virus

<400> 113
cgcaagctta taggatagg gcatttggtg g

31

<210> 114
<211> 6
<212> PRT
<213> Hepatitis B virus

<400> 114
Ile Pro Ala Asn Pro Pro
1 5

<210> 115
<211> 28
<212> DNA
<213> Hepatitis B virus

<400> 115
gcgaagctta gataggggca tttggtgg

28

<210> 116
<211> 6
<212> PRT
<213> Hepatitis B virus

<400> 116
Pro Ala Asn Pro Pro Arg
1 5

<210> 117
<211> 28
<212> DNA
<213> Hepatitis B virus

<400> 117
cgcaagctta aggggcattt ggtggtct

28

<210> 118
<211> 7
<212> PRT
<213> Hepatitis B virus

<400> 118
Cys Pro Ala Asn Pro Pro Arg
1 5

<210> 119
<211> 31
<212> DNA
<213> Hepatitis B virus

<400> 119
gcgaagctta gcaaggggca tttggtggtc t

31

<210> 120
<211> 7
<212> PRT
<213> Hepatitis B virus

<400> 120
Ala Asn Pro Pro Arg Tyr Ala
1 5

<210> 121
<211> 30
<212> DNA
<213> Hepatitis B virus

<400> 121
gcgaagctta ggcatttggt ggtctatagc

30

<210> 122
<211> 8
<212> PRT
<213> Hepatitis B virus

<400> 122
Cys Ala Asn Pro Pro Arg Tyr Ala
1 5

<210> 123
<211> 32
<212> DNA
<213> Hepatitis B virus

<400> 123
gcgaagctta gcaggcattt ggtggtctat aa

32

<210> 124
<211> 7
<212> PRT
<213> Hepatitis B virus

<400> 124
Asn Pro Pro Arg Tyr Ala Pro
1 5

<210> 125
<211> 31
<212> DNA
<213> Hepatitis B virus

<400> 125
cgcaagctta atttggtggt ctataagctg g

31

<210> 126
<211> 8
<212> PRT
<213> Plasmodium falciparum

<400> 126
Asn Ala Asn Pro Asn Val Asp Pro
1 5

<210> 127
<211> 6
<212> PRT
<213> Homo sapiens

<400> 127
Asn Tyr Lys Lys Pro Lys
1 5

<210> 128
<211> 7
<212> PRT
<213> Homo sapiens

<400> 128
Lys Arg Gly Pro Arg Thr His
1 5

<210> 129
<211> 21
<212> PRT
<213> Homo sapiens

<400> 129
 Leu His Pro Asp Glu Thr Lys Asn Met Leu Glu Met Ile Phe Thr Pro
 1 5 10 15

Arg Asn Ser Asp Arg
 20

<210> 130
 <211> 5
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 130
 Arg Ile Lys Gln Ile
 1 5

<210> 131
 <211> 11
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 131
 Arg Ile Lys Gln Ile Gly Met Pro Gly Gly Lys
 1 5 10

<210> 132
 <211> 10
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 132
 Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
 1 5 10

<210> 133
 <211> 14
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 133
 Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp
 1 5 10

<210> 134
 <211> 33
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 134
 Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His
 1 5 10 15

Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile
20 25 30

Leu

<210> 135
<211> 16
<212> PRT
<213> Human immunodeficiency virus type 1

<400> 135
His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg
1 5 10 15

<210> 136
<211> 36
<212> PRT
<213> Human immunodeficiency virus

<400> 136
Tyr Thr His Ile Ile Tyr Ser Leu Ile Glu Gln Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Ala Leu Asp Lys Trp Ala Ser Leu
20 25 30

Trp Asn Trp Phe
35

<210> 137
<211> 26
<212> PRT
<213> Human immunodeficiency virus type 1

<400> 137
Tyr Thr His Ile Ile Tyr Ser Leu Ile Glu Gln Ser Gln Asn Gln Gln
1 5 10 15

Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu
20 25

<210> 138
<211> 19
<212> PRT
<213> Homo sapiens

<400> 138
Gly Arg Glu Arg Arg Pro Arg Leu Ser Asp Arg Pro Gln Leu Pro Tyr
1 5 10 15

Leu Glu Ala

<210> 139
<211> 20
<212> PRT
<213> Homo sapiens

<400> 139
Arg Glu Gln Arg Arg Phe Ser Val Ser Thr Leu Arg Asn Leu Gly Leu
1 5 10 15
Gly Lys Lys Ser
20

<210> 140
<211> 18
<212> PRT
<213> Plasmodium yoelii

<400> 140
Pro Asn Lys Leu Pro Arg Ser Thr Ala Val Val His Gln Leu Lys Arg
1 5 10 15
Lys His

<210> 141
<211> 11
<212> PRT
<213> Plasmodium yoelii

<400> 141
Thr Ala Val Val His Gln Leu Lys Arg Lys His
1 5 10

<210> 142
<211> 22
<212> PRT
<213> Plasmodium vivax

<400> 142
Pro Ala Gly Asp Arg Ala Asp Gly Gln Pro Ala Gly Asp Arg Ala Ala
1 5 10 15
Ala Gly Gln Pro Ala Gly
20

<210> 143
<211> 12
<212> PRT
<213> Avian leukosis virus

<400> 143
 Asn Gln Ser Trp Thr Met Val Ser Pro Ile Asn Val
 1 5 10

<210> 144
 <211> 16
 <212> PRT
 <213> Avian leukosis virus

<400> 144
 Met Ile Lys Asn Gly Thr Lys Arg Thr Ala Val Thr Phe Gly Ser Val
 1 5 10 15

<210> 145
 <211> 19
 <212> PRT
 <213> Foot-and-mouth disease virus

<400> 145
 Pro Asn Leu Arg Gly Asp Leu Gln Val Leu Ala Gln Lys Val Ala Arg
 1 5 10 15

Thr Leu Pro

<210> 146
 <211> 26
 <212> PRT
 <213> Foot-and-mouth disease virus

<400> 146
 Arg Tyr Asn Arg Asn Ala Val Pro Asn Leu Arg Gly Asp Leu Gln Val
 1 5 10 15

Leu Ala Gln Lys Val Ala Arg Thr Leu Pro
 20 25

<210> 147
 <211> 34
 <212> PRT
 <213> Hepatitis B virus

<400> 147
 Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg
 1 5 10 15

Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser
 20 25 30

Gln Cys

<210> 148
<211> 20
<212> PRT
<213> Plasmodium falciparum

<400> 148
Glu Tyr Leu Asn Lys Ile Gln Asn Ser Leu Ser Thr Glu Trp Ser Pro
1 5 10 15

Cys Ser Val Thr
20

<210> 149
<211> 20
<212> PRT
<213> Plasmodium falciparum

<400> 149
Glu Tyr Leu Asn Lys Ile Gln Asn Ser Leu Ser Thr Glu Trp Ser Pro
1 5 10 15

Ala Ser Val Thr
20

<210> 150
<211> 18
<212> PRT
<213> Plasmodium vivax

<400> 150
Asp Arg Ala Ala Gly Gln Pro Ala Gly Asp Arg Ala Asp Gly Gln Pro
1 5 10 15

Ala Gly

<210> 151
<211> 36
<212> PRT
<213> Plasmodium vivax

<400> 151
Ala Asn Gly Ala Gly Asn Gln Pro Gly Ala Asn Gly Ala Gly Asp Gln
1 5 10 15

Pro Gly Ala Asn Gly Ala Asp Asn Gln Pro Gly Ala Asn Gly Ala Asp
20 25 30

Asp Gln Pro Gly
35

<210> 152
<211> 9

<212> PRT
 <213> Plasmodium vivax

 <400> 152
 Asp Arg Ala Ala Gly Gln Pro Ala Gly
 1 5

 <210> 153
 <211> 9
 <212> PRT
 <213> Plasmodium vivax

 <400> 153
 Asp Arg Ala Asp Gly Gln Pro Ala Gly
 1 5

 <210> 154
 <211> 9
 <212> PRT
 <213> Plasmodium vivax

 <400> 154
 Ala Asn Gly Ala Gly Asn Gln Pro Gly
 1 5

 <210> 155
 <211> 9
 <212> PRT
 <213> Plasmodium vivax

 <400> 155
 Ala Asn Gly Ala Gly Asp Gln Pro Gly
 1 5

 <210> 156
 <211> 9
 <212> PRT
 <213> Plasmodium vivax

 <400> 156
 Ala Asn Gly Ala Asp Asn Gln Pro Gly
 1 5

 <210> 157
 <211> 9
 <212> PRT
 <213> Plasmodium vivax

 <400> 157
 Ala Asn Gly Ala Asp Asn Gln Pro Gly
 1 5

<210> 158
<211> 11
<212> PRT
<213> Plasmodium vivax

<400> 158
Ala Pro Gly Ala Asn Gln Glu Gly Gly Ala Ala
1 5 10

<210> 159
<211> 21
<212> PRT
<213> Plasmodium vivax

<400> 159
Pro Ala Gly Asp Arg Ala Asp Gly Gln Pro Ala Gly Asp Arg Ala Ala
1 5 10 15

Gly Gln Pro Ala Gly
20

<210> 160
<211> 18
<212> PRT
<213> Plasmodium vivax

<400> 160
Ala Asn Gly Ala Gly Asn Gln Pro Gly Ala Asn Gly Ala Gly Asp Gln
1 5 10 15

Pro Gly

<210> 161
<211> 19
<212> PRT
<213> Plasmodium vivax

<400> 161
Gln Ala Asn Gly Ala Asp Asn Gln Pro Gly Ala Asn Gly Ala Asp Asp
1 5 10 15

Gln Pro Gly

<210> 162
<211> 44
<212> DNA
<213> Plasmodium vivax

<400> 162
cgcggaattca agcgaacggc gccgataatc agccggcgagg tgca

44

<210> 163
<211> 22
<212> PRT
<213> Plasmodium vivax

<400> 163
Ala Pro Gly Ala Asn Gln Glu Gly Gly Ala Ala Ala Pro Gly Ala Asn
1 5 10 15
Gln Glu Gly Gly Ala Ala
20

<210> 164
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: modified
portion of Hepatitis B core

<400> 164
Cys Val Val Thr Thr Glu Pro
1 5

<210> 165
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: modified
portion of Hepatitis B core

<400> 165
gcaagcttac tattgaattc cgcaaacaac agtagtctcc gg 42

<210> 166
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: modified
portion of Hepatitis B core

<400> 166
Thr Thr Val Val Gly Ile Glu Tyr Leu Asn Lys Ile Gln Asn Ser Leu
1 5 10 15
Ser Thr Glu Trp Ser Pro Cys Ser Val Thr
20 25

<210> 167
 <211> 27
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: modified
 portion of Hepatitis B core

<400> 167
 Thr Thr Val Val Cys Gly Ile Glu Tyr Leu Asn Lys Ile Gln Asn Ser
 1 5 10 15
 Leu Ser Thr Glu Trp Ser Pro Ala Ser Val Thr
 20 25

<210> 168
 <211> 217
 <212> PRT
 <213> *Spermophilus variegatus*

<400> 168
 Met Tyr Leu Phe His Leu Cys Leu Val Phe Ala Cys Val Pro Cys Pro
 1 5 10 15
 Thr Val Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Asp Met Asp
 20 25 30
 Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu Asn Phe
 35 40 45
 Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp Thr Ala
 50 55 60
 Ala Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys Ser Pro
 65 70 75 80
 His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Glu Glu Leu Thr
 85 90 95
 Arg Leu Ile Thr Trp Met Ser Glu Asn Thr Thr Glu Glu Val Arg Arg
 100 105 110
 Ile Ile Val Asp His Val Asn Asn Thr Trp Gly Leu Lys Val Arg Gln
 115 120 125
 Thr Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gly His Thr Val
 130 135 140
 Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Ala Pro
 145 150 155 160
 Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu His Thr
 165 170 175

Val Ile Arg Arg Arg Gly Gly Ser Arg Ala Ala Arg Ser Pro Arg Arg
180 185 190

Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg
195 200 205

Arg Ser Gln Ser Pro Ala Ser Asn Cys
210 215

<210> 169
<211> 651
<212> DNA
<213> *Spermophilus variegatus*

<400> 169
atgtatcttt ttcacctgtg ccttggtttt gcctgtgttc catgtcctac tgttcaagcc 60
tccaagctgt gccttggatg gctttgggac atggacatag atccctataa agaatttggg 120
tcttcttatac agttgttgaa ttttcttcct ttggactttt ttccctgatct caatgcattg 180
gtggacactg ctgctgctct ttatgaagaa gaattaacag gtagggagca ttgttctcct 240
catcatactg ctattagaca ggccttagtg tgttgggaag aattaactag attaattaca 300
tggatgagtg aaaatacaac agaagaagtt agaagaatta ttgttgatca tgtcaataat 360
acttggggac ttaaagtaag acagacttta tggtttcatt tatcatgtct tacttttggg 420
caacacacag ttcaagaatt tttggtagt tttggagtat ggattagaac tccagctcct 480
tatagaccac ctaatgcacc cattttatca actcttc'cgg aacatacagt cattaggaga 540
agaggaggtt caagagctgc taggtcccc cgaagacgca ctccctctcc tcgcaggaga 600
aggtctcaat caccgcgtcg cagacgctct caatctccag cttccaactg c 651

<210> 170
<211> 183
<212> PRT
<213> *Hepatitis B virus*

<400> 170
Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
50 55 60

Leu Met Thr Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp Pro Ala
65 70 75 80

Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn Met Gly Leu Lys
85 90 95

Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
100 105 110

Glu Thr Val Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125
 Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140
 Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
 145 150 155 160
 Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
 165 170 175
 Gln Ser Arg Glu Ser Gln Cys
 180

<210> 171
 <211> 185
 <212> PRT
 <213> Hepatitis B virus

<400> 171
 Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15
 Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30
 Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45
 Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
 50 55 60
 Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Gln Asp Pro Ala
 65 70 75 80
 Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys
 85 90 95
 Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110
 Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125
 Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140
 Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg
 145 150 155 160
 Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg
 165 170 175
 Arg Ser Gln Ser Arg Glu Ser Gln Cys
 180 185

<210> 172
 <211> 185
 <212> PRT
 <213> Hepatitis B virus

<400> 172
 Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15
 Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30
 Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45
 Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
 50 55 60
 Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
 65 70 75 80
 Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Val Gly Leu Lys
 85 90 95
 Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110
 Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125
 Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140
 Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg
 145 150 155 160
 Arg Thr Pro Ser Pro Arg Arg Arg Pro Ser Gln Ser Pro Arg Arg Arg
 165 170 175
 Arg Ser Gln Ser Arg Glu Ser Gln Cys
 180 185

<210> 173
 <211> 183
 <212> PRT
 <213> Hepatitis B virus

<400> 173
 Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15
 Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ala Ala Leu Tyr Arg Asp Ala Leu Glu Ser Pro Glu His Cys
 35 40 45
 Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Asp
 50 55 60
 Leu Met Thr Leu Ala Thr Trp Val Gly Thr Asn Leu Glu Asp Pro Ala
 65 70 75 80
 Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn Val Gly Leu Lys
 85 90 95
 Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110
 Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125
 Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140
 Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
 145 150 155 160
 Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
 165 170 175
 Gln Ser Arg Glu Ser Gln Cys
 180

<210> 174
 <211> 183
 <212> PRT
 <213> Marmota monax

<400> 174
 Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
 1 5 10 15
 Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
 20 25 30
 Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
 35 40 45
 Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Asp Glu
 50 55 60
 Leu Thr Lys Leu Ile Ala Trp Met Ser Ser Asn Ile Thr Ser Glu Gln
 65 70 75 80
 Val Arg Thr Ile Ile Val Asn His Val Asn Asp Thr Trp Gly Leu Lys
 85 90 95
 Val Arg Gln Ser Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln
 100 105 110

His Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125
 Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140
 Glu His Thr Val Ile Arg Arg Arg Gly Gly Ala Arg Ala Ser Arg Ser
 145 150 155 160
 Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Ser Gln Ser Pro
 165 170 175
 Arg Arg Arg Arg Ser Gln Cys
 180

<210> 175
 <211> 549
 <212> DNA
 <213> Hepatitis B virus

<400> 175
 atggacatcg acccttataa agaatttgga gctactgtgg agttactctc gtttttgcct 60
 tctgacttct ttccttcagt acgagatctt ctagataccg cctcagctct gtatcgggaa 120
 gccttagagt ctctgagca ttgttcacct caccatactg cactcaggca agcaattctt 180
 tgctgggggg aactaatgac tctagctacc tgggtgggtg ttaatttgga agatccagcg 240
 tctagagacc tagtagtcag ttatgtcaac actaatatgg gcctaaagtt caggcaactc 300
 ttgtggtttc acatttcttg tctcactttt ggaagagaaa cagttataga gtatttggtg 360
 tctttcggag tgtggattcg cactcctcca gcttatagac caccaaagtc ccctatccta 420
 tcaacacttc cggagactac tggtgttaga cgacgaggca ggtcccctag aagaagaact 480
 ccctcgcttc gcagacgaag gtctcaatcg ccgcgtcgca gaagatctca atctcgggaa 540
 tctcaatgt 549

<210> 176
 <211> 555
 <212> DNA
 <213> Hepatitis B virus

<400> 176
 atggacattg acccttataa agaatttgga gctactgtgg agttactctc gtttttgcct 60
 tctgacttct ttccttcagt acgagatctc ctagacacccg cctcagctct gtatcgagaa 120
 gccttagagt ctctgagca ttgttcacct caccatactg cactcaggca agccattctc 180
 tgctgggggg aattgatgac tctagctacc tgggtgggta ataatttgca agatccagca 240
 tccagagatc tagtagtcaa ttatgttaat actaacatgg gtttaaagat caggcaacta 300
 ttgtggtttc atatatcttg ccttactttt ggaagagaga ctgtacttga atatttggtc 360
 tctttcggag tgtggattcg cactcctcca gcctatagac caccaaagtc ccctatccta 420
 tcaacacttc cggaaactac tggtgttaga cgacgggacc gaggcaggtc ccctagaaga 480
 agaactccct cgctcgcag acgcagatct caatcgccgc gtcgcagaag atctcaatct 540
 cgggaatctc aatgt 555

<210> 177
 <211> 555
 <212> DNA
 <213> Hepatitis B virus

<400> 177
atggacattg accccttataa agaattttgga gctactgtgg agttactctc gttttttgcct 60
tctgacttct ttccttccgt cagagatctc ctagacaccg cctcagctct gtatcgagaa 120
gccttagagt ctcctgagca ttgtcacct caccatactg cactcaggca agccattctc 180
tgctgggggg aattgatgac tctagctacc tgggtgggta ataatttggga agatccagca 240
tctaggggac ttgtagttaa ttatgttaat actaacgtgg gtttaaagat caggcaacta 300
ttgtgggttc atatatcttg ccttactttt ggaagagaga ctgtacttga atatttggtc 360
tctttcggag tgtggattcg cactcctcca gcctatagac caccaaagtc ccctatctta 420
tcaacacttc cggaaactac tggtgttaga cgacgggacc gaggcaggtc ccctagaaga 480
agaactccct cgcctcgcag acgcagatct ccatcgccgc gtcgcagaag atctcaatct 540
cgggaatctc aatgt 555

<210> 178
<211> 549
<212> DNA
<213> Hepatitis B virus

<400> 178
atggacattg accccttataa agaattttgga gctactgtgg agttactctc gttttttgcct 60
tctgacttct ttccttccgt acgagatctt ctagataccg ccgcagctct gtatcgggat 120
gccttagagt ctcctgagca ttgttcacct caccatactg cactcaggca agcaattctt 180
tgctggggag acttaatgac tctagctacc tgggtgggta ctaattttaga agatccagca 240
tctagggacc tagtagtcag ttatgtcaac actaatgtgg gcctaaagtt cagacaatta 300
ttgtgggttc acatttcttg tctcactttt ggaagagaaa cggttctaga gtatttggtg 360
tcttttggag tgtggattcg cactcctcca gcttatagac caccaaagtc ccctatccta 420
tcaacgcttc cggagactac tggtgttaga cgacgaggca ggtcccctag aagaagaact 480
ccctcgccct gcagacgaag atctcaatcg ccgcgtcgca gaagatctca atctcgggaa 540
tctcaatgt 549

<210> 179
<211> 549
<212> DNA
<213> Marmota monax

<400> 179
atggacattg accccttataa agaattttgga gctactgtgg agttactctc gttttttgcct 60
tctgacttct ttccttccgt acgagatctt ctagataccg ccgcagctct gtatcgggat 120
gccttagagt ctcctgagca ttgttcacct caccatactg cactcaggca agcaattctt 180
tgctggggag acttaatgac tctagctacc tgggtgggta ctaattttaga agatccagca 240
tctagggacc tagtagtcag ttatgtcaac actaatgtgg gcctaaagtt cagacaatta 300
ttgtgggttc acatttcttg tctcactttt ggaagagaaa cggttctaga gtatttggtg 360
tcttttggag tgtggattcg cactcctcca gcttatagac caccaaagtc ccctatccta 420
tcaacgcttc cggagactac tggtgttaga cgacgaggca ggtcccctag aagaagaact 480
ccctcgccct gcagacgaag atctcaatcg ccgcgtcgca gaagatctca atctcgggaa 540
tctcaatgt 549

<210> 180
<211> 51
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